

CLAIMS

What is claimed is:

1. An array composition comprising:
 - a) a substrate with a surface comprising discrete sites; and
 - b) a population of microspheres comprising at least a first and a second subpopulation, wherein the microspheres of each subpopulation each comprise a plurality of different target analytes;wherein said microspheres are distributed on said surface.
2. The array composition according to claim 1 wherein said microspheres of each subpopulation further comprise an optical signature.
3. The array composition according to claim 1 wherein said microspheres of each subpopulation further comprise an identifier binding ligand.
4. The array composition according to claim 3 wherein said identifier binding ligand is a nucleic acid.
5. The array composition according to claim 1 wherein said target analytes are nucleic acids.
6. The array composition according to claim 5 wherein said nucleic acids comprise genomic DNA.
7. The array composition according to claim 1 wherein said target analytes are proteins.
8. The array composition according to claim 1 wherein said substrate is a fiber optic substrate.
9. The array composition according to claim 1 wherein said substrate is plastic.
10. The array composition according to claim 1 wherein said discrete sites are wells.
11. The array composition according to claim 1, wherein said microspheres are randomly distributed on said surface.

12. The array composition according to claim 1, wherein the microspheres of said first and second subpopulation each comprise a plurality of target analytes from a first and second target source, respectively.
13. The array composition according to claim 13, wherein said first and second target source are first and second patients, respectively.
14. An array composition comprising a substrate comprising discrete sites wherein each of said discrete sites comprises a plurality of different covalently attached target analytes.
15. The array composition according to claim 14, wherein said plurality of different target analytes are covalently attached to said substrate.
16. The array composition according to claim 14, wherein said plurality of different target analytes are covalently attached to microspheres, wherein said microspheres are distributed in said discrete sites.
17. The array composition according to claim 14, wherein said target analytes are nucleic acids.
18. The array composition according to claim 17, wherein said nucleic acids comprise genomic DNA.
19. The array composition according to claim 14, wherein said target analytes are proteins.
20. The array composition according to claim 14, wherein said substrate is a fiber optic substrate.
21. The array composition according to claim 14, wherein said substrate is plastic.
22. The array composition according to claim 14, wherein said discrete sites are wells.

23. The array composition according to claim 14, wherein a first and a second of said discrete sites each comprises a plurality of target analytes from a first and second target source, respectively.
24. The array composition according to claim 23, wherein said first and second target source are first and second patients, respectively.
25. The composition according to claim 1 or claim 14, wherein said discrete sites are at a density of about 100,000 to 10,000,000 discrete sites per cm^2 .
26. The composition according to claim 1 or claim 14, wherein said discrete sites are at a density of about 10,000,000 to 1,000,000,000 discrete sites per cm^2 .
27. The composition according to claim 1 or claim 14, wherein said discrete sites are at a density of about 10,000 to 100,000 discrete sites per cm^2 .
28. A composition comprising a population of microspheres, said population comprising at least a first and second subpopulation, wherein the microspheres of each of said first and second subpopulations each comprise a plurality of different target analytes.
29. The composition according to claim 28, wherein said microspheres of each of said first and second subpopulations further comprise an optical signature.
30. The composition according to claim 28, wherein said microspheres of each of said first and second subpopulations further comprise an identifier binding ligand.
31. The composition according to claim 30, wherein said identifier binding ligand is a nucleic acid.
32. The composition according to claim 28, wherein said target analytes are nucleic acids.
33. The composition according to claim 32, wherein said nucleic acids comprise genomic DNA.

34. The composition according to claim 28, wherein said target analytes are proteins.
35. The composition according to claim 28, wherein the microspheres of said first and second subpopulation each comprise a plurality of different target analytes from a first and second target source, respectively.
36. The composition according to claim 35, wherein said first and second target source are first and second patients, respectively.